

PERSISTENT NEUROBEHAVIORAL EFFECTS IN SCHOOLCHILDREN AND ADULTS AFTER THREE DECADES OF EXPOSURE TO DRIFT CONTAINING ORGANOPHOSPHOROUS PESTICIDES

Amit Ophir, *Neurology and Toxicology Service and Unit, Shaare Zedek, Medical Center, Jerusalem, and Institute of Drug Research, School of Pharmacy, Hebrew University of Jerusalem, Israel*

Elihu D. Richter, *The Department of Occupational and Environmental Medicine, Faculty of Medicine, Hebrew University of Jerusalem, Israel*

Michael Aschner, *Department of Pediatrics, Vanderbilt University Medical Center, Nashville, TN, USA*

Elyakim Doitsch, *Neurology and Toxicology Service and Unit, Shaare Zedek, Medical Center, Jerusalem, Israel*

Uri Wormser, *Institute of Drug Research, School of Pharmacy, Hebrew University of Jerusalem, Israel*

Yoram Finkelstein, *Neurology and Toxicology Service and Unit, Shaare Zedek, Medical Center, Jerusalem, Israel*

Background and Aims: Studies by our group in 1987-1991 showed in-season reversible neurobehavioral effects of low-level, long-term exposure to organophosphorous (OP) pesticides in a cohort of agricultural workers and residents of rural communities in the Hula Valley, Israel. The residents were exposed to pesticide-drift caused by the proximity of the communities to the sprayed fields. This study aimed to review the neurobehavioral effects after three decades in the same cohort and in 8-12 years-old schoolchildren, 75% of whom are "second generation", as at least one of their parents belonged to the original adult cohort.

Methods: Neurobehavioral tests included questionnaire, Trail Making Tests A and B, Digit Span (forward and backward), Digit Symbol Tests and Purdue Pegboard.

Results: Cognitive changes were observed in 98 individuals of the original adult cohort. Performance on both Trail Making Tests was significantly poorer than in the general population. The performance in Trail Making Test B was inversely correlated with the duration of OP pesticide exposure ($r=-0.231$; $\alpha<0.01$). Digit span tests were poor. Females were affected but yet performed better than males in all the tests. Preliminary analysis suggests that approximately 40% of the tested children or one of their siblings was diagnosed in the past with attention span and concentration deficits or Attention Deficit/Hyperactivity Disorder (ADD/ADHD).

Conclusions: The preliminary results demonstrate persistent late neurotoxic effects of lengthy daily OP pesticide exposure in both children and adults. There may be environmental-susceptibility interactions mediating the emergence of ADHD in populations with low-level endemic exposure to OP pesticides.

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